

U.S. Department of Transportation
Federal Aviation Administration

Subject:	INFORMATION: Guidance for Demonstrating Compliance with Seat Dynamic Testing for Plinths and Pallets	Date:	February 22, 2000
From:	Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100	Reply to Attn. of:	00-115-3
To:	SEE DISTRIBUTION		

The purpose of this memorandum is to provide additional clarification on acceptable means to demonstrate compliance with § 25.562 of the FAR for seats installed on “plinths” and “pallets”. Abbreviated criteria for testing plinths and pallets are given in paragraph 10.e., of Advisory Circular 25.562-1A.

The issue of plinths versus pallets was raised in the Aviation Rulemaking Advisory Committee seat test harmonization working group that helped develop the revised AC and was considered, at the time, to be of relatively minor importance. Thus, a simple procedure was included in lieu of a detailed discussion of the underlying rationale for the criteria in the AC. However, it now appears that the frequency of plinth and pallet installations is increasing, and the simple criteria in the AC are not always sufficient to address the design variations that are being presented for certification. This memorandum is intended to provide further explanation of the guidance contained in the AC and promote greater standardization and equal treatment among applicants.

In order to clarify the appropriate certification procedures for plinths and pallets, a brief review of the regulation is needed. Section 25.562(b)(2), requires that the seat be subjected to a prescribed 16g dynamic impulse, with the points of attachment (floor rails or fittings) misaligned with respect to each other. The misalignment is intended to address local distortion between the seat and airplane floor. A lack of tolerance to local distortion has been a primary cause of seat attachment failures, and a fundamental objective of the regulation is to provide for improved retention of seats. Based on accident and research data, the interface between the seat and the airplane has been identified as critical and the regulation requires that the interface to be tested to the prescribed 16g dynamic impulse. The basic airplane floor structure beyond the interface (beams, intercostals etc.) is not required to be dynamically tested or demonstrated to tolerate misalignment. In the case of seats that do not attach directly to the airplane seat track (or equivalent), there is a need to establish the critical interface.

The advisory circular characterizes a plinth as an adapter used to attach a single seat to the floor, and gives an example of a pallet as an adapter used to attach multiple rows of seats. If the seat is essentially connected to the seat track via an adapter, the adapter is functionally part of the seat, and certification testing should take this into account. In that case, the seat and its adapter would be tested dynamically, with the misalignment required by the regulation imposed at the interface of the adapter and the floor.

On the other hand, if seats were installed into the airplane with an adapter(s) such that the adapter(s) was effectively part of the airplane floor, then the critical interface would be between the seat and the adapter. In that case, the dynamic tests would include the seat and its attachment to the adapter, with the misalignment imposed on that interface.

In order to give a simple characterization to the two situations, the AC refers to single seats and multiple row seats. The term “single seat”, as used in the AC, was intended to refer to a seat assembly, which could be as large as five seat places. However, the rationale behind this characterization was that a single seat adapter would be considered a plinth, by virtue of its size and purpose, and therefore a part of the seat. Conversely, a multiple row seat installation was considered sufficiently large that the adapter would have to be a pallet, and therefore part of the floor.

Nonetheless, using the rationale discussed above, there exists the potential for large plinths, and small pallets. The issue is whether the critical interface is between the seat and the adapter, or between the adapter and the airplane. Generally speaking, adapters of the size that contain a single row of seats (whether they are individual seat places or a common assembly), and mount into seat tracks, should be treated as part of the seat for purposes of certification in accordance with § 25.562. Larger, or more integrally mounted adapters, should be assessed to determine whether they should be treated as part of the floor for purposes of certification in accordance with § 25.561.

Any questions may be directed to Jeff Gardlin at (425) 227-2136.

John J. Hickey

DISTRIBUTION:

Manager, Small Airplane Directorate, ASW-100
Manager, Engine and Propeller Directorate, ANE-100
Manager, Rotorcraft Directorate, ASW-100
Manager, Aircraft Engineering Division, AIR-100
Manager, Seattle Aircraft Certification Office, ANM-100S
Manager, Los Angeles Aircraft Certification Office, ANM-100L
Manager, Anchorage Aircraft Certification Office, ACE-115N
Manager, Boston Aircraft Certification Office, ANE-150
Manager, Denver Aircraft Certification Office, ANM-100D
Manager, Atlanta Aircraft Certification Office, ACE-115A
Manager, Wichita Aircraft Certification Office, ACE-115W
Manager, Chicago Aircraft Certification Office, ACE-115C
Manager, New York Aircraft Certification Office, ANE-170
Manager, Airplane Certification Office, ASW-150
Manager, Special Certification Office, ASW-190
Manager, Brussels Certification Staff, AEU-100
Frank Tiangsing, ANM-115
Jasyson Claar, ANM-115
Terry Rees, ANM-115
Steve Soltis, ANM-102N
Van Gowdy